Natural Gas: An Optimistic Outlook
Keynote Address

by
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Abstract

Research into new technology is critical to the oil and gas business, where exploration and production has long involved technology, from the rotary rig to today's 3-D seismic. In Texas, three examples are imaging through and below salt, excellent seismic cross-section graphics, and redevelopment of all producing fields. Technology is important to the Texas Railroad Commission, where we emphasize computers and recruiting staff adept in applying technology.

DOE contributes research that is critical to progress in our industries. Energy also needs a cabinet-level advocate on policy matters in Washington, to speak for producers.

The Railroad Commission's Tex Data project can help the exploration-and-drilling sector find more oil and gas and drill more successful wells and eliminate dry holes. The Commission's records cover over 1 million wells in 68,000 fields, but the old-technology paper and film records are hard to access. Tex Data will modernize the Commission's computer systems, create local networks, improve Internet access, and convert the most valuable data to electronic form. Of 132 million data pages, 30 million are considered valuable. A GRI-funded study by Radian Corporation identified five categories: well production data, 1981-present potential files, well logs, hearing files, and pre-1981 files. Tex Data will help answer the questions: Where are these resources? How much will they cost to develop? What will be the probable recovery volume and rate? The Commission's computer-based information resources in environment also could be made available to the Tex Data project. Of $10 million needed for Tex Data, $1 million has been raised, and Commission data will be on the Internet soon.

There is new optimism in the Commission, Texas, and the industry. The future for natural gas is bright, with the industry accounting for about $1 in every $9 to $10 of the state's economic output. Texas will be producing at or near current levels for a long time. In the case of natural gas, Texas producers might even increase production.

Introduction by Sandra Waisley

(Acting Deputy Assistant Secretary for Oil and Gas, DOE Headquarters)

It is our pleasure to have with us today the Chairman of the Texas Railroad Commission. Since being elected in 1994, he led and won the fight to reorganize the Commission for the first time in 104 years—he hasn't been around that long—returning good government to the people. He has been a visionary, leading the effort to bring the Commission into the electronic age by transferring the Commission's 152 million pages of historical oil and gas records into electronic form. Chairman Matthews is also a national voice on energy issues. He serves as Chairman of the Interstate Oil and Gas Compact Commission's Regulatory Practices Committee. He is currently Governor Bush's representative on the Interstate Mining Compact Commission. He is also a former Mayor of the City of Garland, the ninth largest city in Texas. Charles is truly a public servant in the best sense. Please welcome Chairman Charles Matthews today. Thank you.

Address by Charles Matthews

This is my second speech today. I rushed to get over here because I wanted to hear Ken Lay. Ken, as you already know, is the most innovative businessman in America. All of us in the oil and gas business follow what he does. I always say of Ken, "he does what everybody else thinks about." You constantly think of new ideas, and then you discover that Enron is already doing them! I also particularly appreciate his contribution to our state. He freely gives his time outside of business interests to very civic activities. That is very important to me, and I compliment him for the contributions he makes, not only to Texas, but to the country. It is a genuine pleasure for me to help keynote this conference with Ken today, and hopefully we can learn a little bit about each other this morning.

Technology in the Natural Gas Industry

This conference is one of the reasons I support our having a U.S. Department of Energy. Research is critical to progress and to growth in any industry. It is critically important to the oil and gas business. DOE recognizes the importance of research, and together with entities like the Gas Research Institute, contributes research that is critical to the progress of our industries. Producers have benefited from this research. Today, the natural gas industry is healthier because of it. I also support DOE for a larger reason than just the research that it and its predecessor institutions have fostered over the years. I believe that energy needs a cabinet-level voice to speak out on policy matters in Washington. I might not always agree with the policies advocated. But we must have a player at the highest levels of government. Ideally, it should be someone who occasionally speaks out for producers. For example, we frequently need a counterbalance to the Environmental Protection Agency. DOE can, and on occasion has, provided that balance.

Now, let me get to the real subject of this conference—technology. I believe that anyone who claims to be knowledgeable about the oil and gas industry appreciates the importance of technology. It is common now for experts to emphasize the importance of technology in the

future of the oil and gas industry. Technology has always been very important to the industry. The business of oil and gas exploration and production has long involved technology, from the introduction of the rotary rig to today's 3-D seismic. advance of technology and industry's application of it over the past decade has been unparalleled. An example is geophysics, particularly seismic, which is leading the charge.

In Texas, three great examples come readily to mind. First is the subsalt clay that lies offshore. The ability to image through and below salt has brought on a potentially tremendous hydrocarbon resource. It previously was undeveloped and, as far as I know, was unknown.

The second example is the East Texas Cotton Valley pinnacle reef exploration, which is emerging as a very hot play. Two recent issues of the *Oil and Gas Journal* have had some great articles and graphics on this play. In fact, the graphics of the seismic cross-section were so good that even I could see the dim spots that they called a "reefal abnormality." It is also worth noting the terms used to describe this play. They were terms like "impact play," "3-D seismic play," "an expensive play," and "a dangerous play." I appreciate both the cost inherent in exploration today and the risk.

The third example where technology in general, and 3-D seismic in particular, has had a major impact is in the redevelopment of all producing fields. Most Texas oil is found in or near where it is now being produced. In short, it is an exploration business. Effective use of 3-D seismic and various engineering and geological field data with reservoir modeling is becoming more and more the way of doing business in the oil patch. As time passes, you can reshoot the field, compare and contrast the results, and bang, you've got 4-D seismic.

This conference highlights several projects that are DOE-funded or cofunded with GRI, and that have demonstrated the value of research in advanced technology. One is a secondary gas recovery project in south Texas. You will be hearing more about that from the project leader, which is the University of Texas Bureau of Economic Geology, so I will just briefly mention it here. The SGR project has increased drilling and completion efficiency in south Texas. As a result, reserve additions per well showed a market increase. Operators responded by increasing activity and changing their approaches to field development. As a consequence, substantial additional reserve additions are expected in the Railroad Commission's Districts 3 and 4.

Clearly, technology will be important in the future. I want to emphasize that, in my judgment, technology also holds the same importance for the Railroad Commission. We are strong believers in applying technology to our operations, and we are working on several projects to update and modernize our capabilities. We are emphasizing computers heavily and are recruiting staff who have industry background and the ability to apply technology. Some of our staff is here today. I would like to introduce two of them, and then tell you about a project they are heading up. They are working with some funding through DOE's Advanced Computational and Technology Initiative, or ACTI as we call it.

First, I would like to introduce David Schieck, director of our Flagship Division. David is a geologist with 23 years of experience as an explorationist with Conoco prior to joining us in February 1996. Also, here is Dewayne Cravens, who joined us last summer. Dewayne is an engineer who started with Amoco and subsequently worked for an independent oil company. He is the Assistant Director of the Oil and Gas Division, and together with David is heading the project that I will discuss next. David and Dewayne, you do a great job for the Commission, and we are delighted to have you.

The Tex Data Project

The project I want to discuss is called Tex Data. I have now been working on it for two years. People tease me, saying politicians don't work on projects that are this long-range. I tease them back and say, "Well, they do when they have six-year terms!" I am here today to enlist your support for Tex Data. I will warn you, I have my tin cup out! I believe that Tex Data is a triple-header. It will have researchers like yourself, it will help the industry, and it will help the citizens of this state—and indeed the nation—by increasing domestic oil and gas supplies. I see Tex Data as a way the Railroad Commission can help the exploration-and-drilling sector find more oil and gas, and drill more successful wells and pure dry holes.

Tex Data is a Texas project. But all of you from other states should listen up, because I'll bet it has applications for you, too. Your state's regulatory body, just like our Railroad Commission, has large amounts of data that will be helpful to you. In our case, the Railroad Commission has collected documents encompassing the history of each Texas oil and natural gas well since 1919. From the drilling permit application, to the completion report, to the monthly production reports, to the final plugging report, this material covers over 1 million wells in some 68,000 fields. At present, most of this technical data is difficult to access because of the shared number of records and the way they are currently stored on paper, microfiche, and microfilm. We propose to cull all this data and make the most valuable data readily available in electronic form.

The Tex Data project has two components. The first requires modernizing the Railroad Commission's computer information systems. There are two aspects to this modernization. First, we are tying together our district offices with Austin, via the local area networks and wide area networks. Second, we are setting up Internet access to server databases in Austin.

The second component of the Tex Data project will involve converting to electronic form the Commission's most valuable energy and environmental information. In this way, the information can be made easily available to our district offices and to geologists and engineers such as yourselves. We estimate that we have 132 million pages of oil-and-gas-related data. Obviously, not all of it is useful in finding oil and gas, but we estimate that about 30 million pages of it is. The problem is that our data currently are difficult, if not impossible, for the average operator to find. Indeed, in many cases, no one knows it exists. I have had many oil and gas finders tell me that they now spend 90 percent of their time looking for data, and 10 percent of their time looking for oil! We want to change that. The data chase by geologists and engineers

and other exploration-and-development experts will get a lot shorter, once we get Tex Data on-line.

As I mentioned, I started work on this project two years ago, in 1995. The first thing I did was get the Gas Research Institute to fund the study of the records. Myron Gottlieb, who is in the front row here, and from whom you will hear later, was the Project Manager for this study, which was conducted for GRI by the Radian Corporation, a worldwide company that happens to be based in Austin. Radian starting work in September 1995 and completed its report early last year. Let me briefly summarize Radian's report.

Radian's first task was to determine how much of our material had potential value for finding more oil and gas. Radian's high-grading of our data led to the 30-million-page estimate I gave you earlier. Radian arrived at the 30-million-page figure by dividing our records into different categories, and then asking members of industry and experts to assess their value. Some of you in this audience were probably surveyed. Based on this survey, Radian listed five categories of material of value. Let me list those for you.

The first item is well-production data. We have collected monthly production data since the 1920s. Since about 1980, the volume produced by each well has been entered into an electronic database. However, about 60 years' worth of data, among the most highly rated in our survey, is on paper, microfiche, or microfilm spreadsheets, or some of the old handwritten production ledgers.

The second category is potential files from 1981 to current. The potential files contain many of the forms collected by the Commission that were determined through Radian's comprehensive energy survey to be of the highest relative value for making E&P decisions. The potential files have not been filmed since 1981, so they are not backed up at all. This information is therefore vulnerable to loss through misfiling, theft, or fire.

The third category of data is well logs. As of this year, the Commission has received an estimated 830,000 logs. All are available for free review or for copying at cost—if they can be found. Well logs received since 1985 are probably curated. However, logs filed with the Commission prior to 1985 are not collected in one central location, nor are they indexed.

The fourth category of data assessed by Radian is our hearing files. Over the years, the Commission has conducted 115,000 contested hearings. To prove a claim, extremely valuable technical data—including seismic data, maps, plats, well logs, and other data—must be submitted to the Commission. Testimony by experts in these cases amplifies the significance of the data that is presented. This material, if readily available, could be used to great advantage by operators in making E&P decisions.

The fifth and final category of data is known as the "pre-1981 potential files and other valuable information" on microfiche and microfilm. Radian proposes a pilot project on this information to evaluate it.

Everyone I have talked with so far believes that Tex Data is a valuable project and that

additional successful oil and gas wells will be drilled if we proceed. Most of you, as experts in drilling with geological and engineering data, already know why this is so. In my case, my opinion is based on discussions with David Schieck, Dewayne, and others in the industry who have similar expertise.

The well-production data, the well-potential files, the hearing files, and the well logs each provide information necessary for successful drilling-and-development decisions. Here are the key questions that these data will help E&P operators answer: First, where are these resources—that is, where can unexplored oil and gas be found? Second, how much will it cost to develop these resources? And third, what will be the probable recovery volume and rate? Data on many fields already exist. For example, many major oil companies have data on their own wells. So, a fair question is: is more data needed? I believe the answer is "yes."

The more quality data that is available, and the more accessible and complete it is, the more likely explorationists will be able to answer those key questions. Data is particularly critical to a state with mature resource bases, like Texas. I believe it will lead to increased new field discoveries and incremental reserve additions, particularly in and around old producing fields. As you are aware, the focus of E&P decisionmaking varies in magnification, depending on what is being analyzed—a basin, a prospect, or a single field. However, each incorporates the same data sets—sets represented by the Commission's well-production, potential hearing, and log files. The data will create the fullest, most accurate decisionmaking foundation possible. Because the data will be on-line, it can be used, studied, or manipulated in conjunction with whatever variables the engineer or geoscientist wants to examine.

In short, the Commission's data will enable operators of all levels of technological sophistication to more fully and accurately answer three key questions: what is there, what is left, and how are we going to get it?

Should we move ahead with the Tex Data project at the Texas Railroad Commission? I believe the answer is yes. Technology is the key to improving all production. The technology we should be using more and better is computing. It is a vital tool in developing the state's mature resource base. In sum, I strongly believe in Tex Data as the focus, the lever of technology that can be affectively applied to increase oil and gas production in this state.

I also point to environmental applications of Tex Data, recognizing that a number of people in this room work in that field. The Commission has a wide variety of computer-based information resources in environment. It could be made available to the Tex Data project. For example, we have extensive databases of permit information that could be put on-line. This information includes items on waste-disposal facility locations. The Commission databases contain some permitting and operation information and over 83,000 injection, disposal, and hydrocarbon storage wells. That should be invaluable to decisionmakers who have on-line access.

So, what is the status of the Tex Data project? Radian estimated it would take about $10 million to fully implement the project. We have located about $1 million so far, mainly federal funds to start modernizing our nine district offices. We have done three district offices so far and expect to complete the balance this year [1997]. So, our district offices soon will be

highly computer-capable, including being wired into Austin on a real-time basis. We are also making progress on an Internet connection. We expect to start putting some production data on the Net this fall. One of the national laboratories—Lawrence Livermore—and the Texas A&M Petroleum Engineering School, with funding through the ACTI program, is working with the Commission to develop our Internet capability to support remote data retrieval. So, in the not-too-distant future, you and other geologists and engineers will be able to access Commission data from your offices, wherever you might be located.

Let me conclude my discussion of Tex Data by saying that I believe there is great potential remaining in oil and gas. The Tex Data project will help us tap those resources for many years to come. The Tex Data project merits your support, and I hope you will consider it.

Economic Status of the Texas Oil and Gas Industry

Now let me shift focus and wrap up with a brief status report on the economics of the Texas oil and gas industry. As you can probably tell by now, I am an optimist. I believe there is a new air of optimism at the Railroad Commission and in the oil and gas industry. For the first time in a long time, both the Commission and the industry are looking to a brighter future. The consensus, in my judgment, is that industry in probably in far better shape than it has been in a decade, or perhaps even longer. Industry's increased activity is reflected at the Railroad Commission by increases in requests for all kinds of permits. In calendar year 1996, requests for drilling permits increased substantially. For the full year, permits rose by 13 percent and new drilling permits were up 16 percent. However, in this fiscal year, which in state government started September 1, 1996, drilling permits have been up dramatically. For this period, new drilling permits are up 31 percent compared with the same period a year ago. Total drilling permits, including recompletions, are up 23 percent.

The upturn in the oil and gas industry is good news for the Texas economy. In 1996, oil production declined, but less so than in any year since 1991. In fact, the decline was only 3.2 percent, in contrast with the two previous years, where the decline was about 5.6 percent. The difference between these two decline rates represents about 12 million barrels of oil that was available to pay taxes, maintain and create jobs, and feed the Texas economy.

Natural gas had another good year in 1996. Indeed, some would say that gas had a very good year. Production for the third year in a row matched the level achieved in 1986. More importantly, prices were the best since 1985. Producers responded by showing their faith in their business. As we know from completion numbers now in, producers plowed their profits back into the gas fields. I am happy to report that gas well completions for 1996 numbered 4,060, the highest that figure has been in 11 years, since 1985. The future for this premium fuel does indeed seem bright. Clearly, prospects for the oil and gas industry are better than they have been for some time.

Everyone in the state is benefiting from this upturn. The industry accounts for about $1 in every $9 to $10 of the state's economic output. We estimate that in 1995, the industry pumped about $52 billion into the state's economy. In 1996, that number rose to $60 billion. To sum it

up, I believe that Texas will be producing at or near current levels for a long time. In the case of natural gas, Texas producers might even increase production, if we can increase our share of a growing national and North American market.

Let me stop now and tell you that I have enjoyed being with you. May God bless us all, and may God bless Texas! Thank you for listening.